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THE USE OF PROGRAMMED MATERIALS IN A FRESHMAN ORIENTATION PROGRAM.

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IN FALL 1964, PROSPECTIVE STUDENTS AT THE UNIVERSITY OF MINNESOTA'S GENERAL COLLEGE WERE ASSIGNED TO GROUPS FOR 2-DAY ORIENTATION SESSIONS, IN WHICH THEY WERE INTRODUCED TO GENERAL ASPECTS OF THE UNIVERSITY, COMPLETED A TEST BATTERY, PARTICIPATED IN A "COLLEGE MEETING", AND REGISTERED FOR CLASSES. AN EXPERIMENTAL GROUP RECEIVED THE CONTENT OF THE "COLLEGE MEETING" FROM PROGRAMED MATERIALS, WHILE A CONTROL GROUP RECEIVED THE TRADITIONAL LECTURE INFORMATION. ALTHOUGH INTERGROUP DIFFERENCES WERE SMALL, EXPERIMENTAL GROUP MEMBERS PERFORMED SIGNIFICANTLY BETTER ON AN IMMEDIATE POST TEST OF KNOWLEDGE ABOUT THE COLLEGE. STUDENT EVALUATIONS OF THE PROCEDURES DID NOT DIFFER SIGNIFICANTLY BETWEEN GROUPS. A FOLLOWUP INFORMATION TEST AND EVALUATION INSTRUMENT ONE MONTH AFTER THE SESSIONS SHOWED NO SIGNIFICANT INTERGROUP DIFFERENCES. MORE LECTURE GROUP SUBJECTS WERE JUDGED WELL PREPARED FOR REGISTRATION. MORE LECTURE GROUP SUBJECTS COMPLETED PRESCRIBED TESTS AS SCHEDULED. A COMBINATION WAS PROPOSED, WITH PROGRAMED INFORMATION TO BE FOLLOWED BY OPPORTUNITY FOR INTERACTION BETWEEN STUDENTS AND COLLEGE REPRESENTATIVES. THIS DOCUMENT IS VOLUME 3, NUMBER 1, OF "THE GENERAL COLLEGE STUDIES," 1966-1967. (WO)

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JUNIOR COLLEGE
INFORMATION

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The technological explosion in our age of automation has many ramifications in educational theory and method. The use of 'programmed' materials is one of the most widely heralded innovations in the crusade to individualize instruction. Programmed learning, or auto-instructional textbooks, are now routinely used in almost every sector of the school and college curriculum. So rapid has been the development of programmed instruction that it is probably not inaccurate, at this date, to speak of traditional applications of programmed learning techniques as distinct from innovative uses of them.

The tradition of using programmed materials is well established in the General College. In fact, the General College provided the original home for what is now the University of Minnesota's Center for the Study of Programmed Learning, which is under the direction of Dr. Russell Burris, a former General College faculty member.

One of the results of General College experimentation with programmed instruction was the utterly predictable recognition that a program's most obvious virtue is its economy and efficiency in transmitting information. This fact led the Student Personnel Office of the College to experiment with programming. As a result, programmed materials were used and tested in the General College annual freshman orientation and registration program in the fall of 1964. The experiment is described in this issue of The General College Studies.

The experiment was carried out under the direct supervision of Dr. Ralph E. Packard, then a counselor in the General College Student Personnel Office. The findings presented here are a fragment of a complete report available either from the University of Minnesota Library or from University Microfilms, Ann Arbor, Michigan.

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THE USE OF PROGRAMMED MATERIALS IN A FRESHMAN ORIENTATION PROGRAM

The Problem

Orientation of new students is a widespread but largely unvalidated practice in higher education. Orientation programs have traditionally included welcoming activities, social functions, testing, course registration, and the dissemination of various kinds of information. While many recent writers have emphasized the importance of orienting students to the intellectual aims and values of higher education, the need for informational orientation has also been universally recognized. Among educators, it is widely assumed that the orientation responsibility of colleges and universities includes presenting information deemed important to the entering student. Graduation and curricular requirements, institutional expectations, special academic programs, registration procedures, and student personnel services represent topics with which freshmen need familiarity if they are to make thoughtful decisions in planning their educational experiences.

Typically, information has been presented to freshman in orientation programs through the medium of the lecture. Despite obvious difficulties and regular criticism, lectoring continues to be a major part of many, if not most, college orientation programs. In order to explore an alternative technique for presenting orientation information to new students, a programmed orientation workbook was tested in the University of Minnesota's General College Freshman Orientation and Registration program during Fall Quarter, 1964.

Subjects receiving information through the medium of the program were compared with students who experienced a traditional lecture.

Comparisons were made on the basis of several criteria, including performance on an objective test of College information, subject reaction to College Meeting experience, and ratings of preparation for course registration.

The programmed workbook written for this experiment was not intended to replace all of the activities of the new student orientation program; it was, rather, viewed as a method potentially useful for presenting information only.

Orientation at the University of Minnesota

Although many other activities take place, a series of two-day orientation-registration sessions provide freshmen their basic orientation experience at the University of Minnesota. All students enrolling for the first time in the fall quarter of 1964 were expected to participate in one of these two-day sessions. Prospective entrants were assigned to a specific orientation group after their applications for admission had been received and approved. Twenty-eight orientation sessions were held for potential General College students, the groups convening from mid-August until near the end of September. During the two-day periods members of the groups were guided through a series of activities: they were introduced to general aspects of the University; they took a battery of tests; they met with representatives of the General College in a "College Meeting"; and, finally, they registered for fall quarter classes. This study is concerned only with the activities in the College Meeting.

The Programmed Orientation Workbook

The programmed orientation workbook used in this study was written explicitly for use by prospective General College freshmen.

The program was linear in format, consisting of an orderly succession of logically related items. Content areas of the workbook corresponded to topics outlined in the "Suggested Agenda for General College Orientation Meetings," an outline which leaders of College Meetings used as the basis of their discussions. Areas covered included: (1) introductory material, (2) the college grading system, (3) the General College comprehensive examination, (4) the Associate in Arts degree, (5) requirements for transfer to other colleges, (6) availability of the College Counseling Service, (7) the Faculty advising System, and (8) specific preparation for course registration. An attempt was made to specify workbook objectives in behavioral terms before beginning work on the initial draft of the program.

The first version of the program was tested on 25 students newly enrolled in the General College during the summer of 1964. Responses of subjects were analyzed and workbook items which evoked an error rate in excess of ten per cent were revised or eliminated. The resulting revised draft was also tested, the 44 pilot group subjects coming from one of the earliest groups of students to experience orientation for fall quarter of 1964. Intended procedures of the study were followed, the criterion instruments also being tested. Response error rates for individual items were again calculated and appropriate revisions made. The second revision of the program was the one used in the experiment.

Instruments Used in the Study

Three instruments were constructed for use in testing hypotheses of the study. The General College Information Test (GCIT) was written using the College's statement of its objectives and the

programmed workbook itself as guidelines; the GCIT was used to measure learning outcomes of the College Meetings. Steps were taken to insure that information presented in control lectures was equivalent to workbook content.

The final version of the GCIT contained 45 items, and evidence was deduced relevant to the content validity of the test. The test also successfully discriminated between groups possessing varying degrees of familiarity with the General College, this discrimination being taken as an indication of some construct validity.

Using a method developed by Hoyt, a coefficient of internal consistency of .68 was obtained. Also, a test-retest reliability coefficient of .69 was computed from scores of 33 study participants who retook the GCIT after an interval of approximately one month.

Another variable of interest was the subjects' reactions to the College Meeting experience. An instrument was constructed, entitled the Orientation Meeting Evaluation Inventory (OEI), using Osgood's Semantic Differential technique as a model. The OEI represented an attitude measurement application of the Semantic Differential, the rationale for which is presented in Osgood. General validity and reliability information quoted by Osgood was reported.

The OEI consisted of a single concept to be rated ("General College Orientation Meeting") and fifteen bipolar adjectives (e.g., successful-unsuccessful) each separated by a seven-step rating scale. Thirteen of the scales had been shown to have predominant loadings on a dimension labeled "evaluative" in factor analytic studies by Osgood. Two others were included because of an assumed relevance to the concept. A single attitude score was derived for each OEI by summing ratings on the five "purest" scales, ie, those

with heavy loadings on evaluative but negligible loadings on all other factors. This single score was used in testing for differences between treatment conditions; groups were also contrasted on individual scales. A minor concern of the study was the students' preparation for registration. A simple instrument was constructed for use by registration advisers in rating the registration preparation of each subject. One of four possibilities was checked, with categories ranging from "Well planned and correct program" to "No evidence of prior planning." Ratings were made of the tentative course schedule presented by each subject at the time of his registration appointment. Registration advisers were asked to judge the "mechanical" accuracy of the student's planned program, such as absence of time conflicts. Raters were instructed to pay no heed to the "quality" of a student's tentative program. The fifteen members of the General College faculty employed during the six weeks registration-orientation period made all ratings.

Hypotheses of the Study

Four major hypotheses were tested in the study:

1. There are no differences in immediate recall of College orientation information, as measured by an objective test of College information, between General College students whose orientation experience included use of a programmed College-information workbook and those who received the same information through traditional lecture methods.
2. There are no differences in immediate evaluative reaction to College orientation meetings, as measured by Semantic Differential techniques, between General

College students whose orientation experience included use of a programmed College-information workbook and those who received the same information through traditional lecture methods.

3. There are no differences in later retention of College orientation information, as measured by an objective test of College information, between General College students whose orientation experience included use of a programmed College-information workbook and those who received the same information through traditional lecture methods.

4. There are no differences in later evaluative reaction to college orientation meetings, as measured by Semantic Differential techniques, between General College students whose orientation experience included use of a programmed workbook and those who received the same information through traditional lecture methods.

Three additional hypotheses considered of lesser importance were also tested:

5. There are no differences in preparation for fall quarter registration, as measured by a four-alternative registration rating form, between General College students whose orientation experience included use of a programmed College-information workbook and those who received the same information through traditional lecture methods.

6. There are no differences in proportions of subjects delinquent in taking a College achievement test battery required of all first quarter freshmen, between General

College students whose orientation experience included use of a programmed College-information workbook and those who received the same information through traditional lecture methods.

7. There are no differences in proportions of subjects utilizing College counseling services during their first quarter of registration, between General College students whose orientation experience included use of a programmed College-information workbook and those who received the same information through traditional lecture methods.

Description of the Sample

The universe of subjects from which the sample was drawn consisted of all freshmen enrolling for the first time in the General College of the University of Minnesota at the beginning of the fall quarter 1964.

Sampling units were two-day orientation groups rather than individual subjects. Groups oriented during the first of the six weeks of orientation were not included, as it was during that time that pilot subjects were used in the final revision of the programmed workbook. Two groups were randomly selected from each of the remaining five weeks of orientation (excluding groups convening on Friday). The sample eventually numbered 589 subjects oriented during ten different periods of time and included approximately one-third of the total population.

Sample and population were comparable on high school achievement, college aptitude, sex ratio, and age variables. On the basis

of the selection procedures, the large size, and the equivalent characteristics, it was concluded that the sample represented the population.

In order to test the two hypotheses dealing with later performance on criterion measures, follow-up subjects were selected from the original sample. Six subjects were randomly selected from the three treatment conditions in each of the ten orientation groups included in the original sample. Eighteen subjects thus were selected from each of the ten orientation groups, making a total follow-up sample of 180 subjects. Follow-up data were obtained from 162 of the subjects, a response of 90 per cent. Scholastic aptitude, high school achievement, sex, and age characteristics of the follow-up sample were equivalent to such distributions in the original group.

Study Conditions and Procedures

The random allotment of subjects to treatments took place within each of the ten orientation groups included in the sample. As subjects arrived for the initial orientation meeting they were randomly assigned to one of three treatment conditions--experimental group one (E_1), experimental group two (E_2), or the lecture control group (C_1). Subjects met in one of these three groups only during the two scheduled College Meetings; other events were usually attended by the combined group.

The two experimental conditions were identical with the exception that one individual directed all E_1 groups while a different person supervised E_2 groups. Each group leader followed a detailed agenda to insure equivalent procedures. After a brief introduction, subjects worked through the programmed manual. As students finished the workbook they were given a "homework packet" containing a

biographical inventory and forms for planning a tentative fall quarter schedule of classes.

In the C_1 group similar information was presented by a lecturer who had used the programmed workbook and criterion measures in his lecture preparation. Several of his presentations were tape recorded, one being selected at random for intensive comparison. Three members of the General College student personnel staff judged the similarity of workbook and lecture content, the consensus being almost unanimous that equivalent information was presented.

A supplementary control group consisting of 218 students who had attended College Meetings directed by General College faculty members not otherwise involved in the study was also identified. It was felt that comparisons between a group who had been "oriented as usual" and groups involved in the experiment would be informative. The analysis involving C_2 was tangential to the major purposes of the investigation and was reported in a supplementary section. Although the C_2 group was not randomly selected, it was very similar to the combined experimental groups on scholastic aptitude, high school achievement, sex, and age variables.

Immediate GCIT and OBI data were collected during the second College Meeting of the two-day orientation period, and follow-up data were gathered after fall quarter had been in session approximately one month. Ratings of registration preparation were obtained at the time subjects registered for fall quarter classes. The major hypotheses were analyzed using three-way analyses of variance. The registration preparation hypothesis was tested by one-way analysis of variance after ratings had been transformed into normalized standard scores. Non-parametric procedures were used with the remaining minor hypotheses.

Results

1. The hypothesis dealing with immediate GCIT scores was rejected. Both B_1 and B_2 mean scores appeared significantly greater than C_1, although in practical terms the spread was slight. The finding was qualified by a significant treatment by time interaction. Analysis of the interaction indicated that while scores of workbook subjects remained constant throughout the experiment, GCIT scores of lecture subjects tended to increase over the five weeks. Later scores of lecture subjects were equivalent to workbook scores throughout.
2. There were no differences between treatment groups on OBI immediate scores, and the null hypothesis could not be rejected. Mean ratings of all groups were in a favorable direction, the treatment group means falling between "Quite closely related" and "only slightly related" Semantic Differential scale positions. The fifteen OBI scales also were analyzed individually, twelve of the fifteen producing non-significant results. Three scales (wise-foolish, meaningful-meaningless, interesting-boring) did have significant F rations and appeared to be rated slightly more favorably by C_1 subjects.
3. There were no significant differences between treatment conditions on GCIT follow-up scores obtained after school had been in session approximately one month. A significant time effect was noted, and because of the follow-up procedure, had been expected. The significant treatment difference existing immediately following orientation was not observed after the subjects had been enrolled for several

weeks. Since the treatment effect was not significant the null hypothesis could not be rejected.

4. OBI follow-up ratings were very similar to immediate ratings. There were no treatment group differences and the null hypothesis was not rejected. Individual OBI scales again were analyzed, none of the resulting fifteen treatment effects being significant.

5. The null statement of the preparation for registration hypothesis was rejected. Comparisons between treatment groups indicated lecture subject ratings were significantly more favorable than workbook subject ratings. A greater proportion of lecture subjects had been judged "well prepared" for registration.

6. The minor hypothesis dealing with the General College Comprehensive Examination was rejected. It was concluded that a greater proportion of lecture subjects followed directions and completed the examination as scheduled. The percentages of subjects who became delinquent in completing the test ranged from 13.6 per cent in the B_1 group to 6.3 per cent in the C_1.

7. Proportions of workbook subjects who contacted the College counseling offices during fall quarter appeared greater than comparable proportions of lecture subjects (e.g., 19.7 per cent in B_1 and 12.0 per cent in C_1). The chi-square value was not significant, however, and the null hypothesis could not be rejected.

8. Mean GCIT immediate score for the C_2 supplementary group was considerably less than mean scores of any experimental groups, and the differences remained significant at follow-

up. Both immediate and follow-up OBI scores appeared equivalent over supplementary and treatment groups. Preparation for registration ratings of C_2 subjects were significantly less favorable than C_1 subject ratings and similar to ratings of workbook subjects.

Conclusions and Implications

1. Learning occurred during the College orientation meetings no matter what the mode of instruction--programmed workbook or lectures. If a score of eleven is accepted as indicating the chance level on the General College Information Test, subjects apparently knew something of the College before orientation. Pre-orientation scores of 122 prospective freshmen had averaged 21.6 correct items. (The GCIT contained 45 multiple choice items, most having four alternatives.) Post-orientation scores were considerably higher and reinforced the conclusion that learning had taken place.

Subjects performed almost as well on the criterion measure after school had been in session one month, indicating that the immediate learnings tended to be stable over a period of several weeks. Whether the stability is primarily due to the College Meeting presentation or to school experiences during the early weeks of fall quarter is not known.

The writer found no studies which lent empirical support to the assumption that learning occurs as a result of orientation activities. The conclusion that such learning was demonstrated in this investigation seems to be important.

2. Given the Orientation Evaluation Inventory as criterion, subjects reacted favorably to their College Meeting experiences. Although the typical response was not one of total enthusiasm, it

cannot be concluded that subjects were unfavorable or even neutral in their evaluations.

Subjects generally rated such adjectives as "successful," "important," "good," and "meaningful" as "quite closely related" to the concept "General College Orientation Meeting." Reactions were similar when follow-up subjects were asked to evaluate their College Meeting experience after several weeks had passed. Since several prior studies have reported positive student reactions to orientation activites, this conclusion was in line with expectations.

The possibility of the "halo" effect should not be discounted, however. It seems reasonable to assume that entering students typically have positive feelings about the school in which they are enrolling. The degree to which ratings of orientation experiences might be influenced by such generalized feelings is a matter of conjecture.

3. Probably the most important conclusion to be drawn is that outcomes on major criteria showed few differences between programmed workbook and lecture conditions. The score derived from the OBI did not differentiate between treatments. In addition, differences were non-significant on twelve of fifteen individual scales at the time of immediate data collection and on all scales at later follow-up.

Despite the lecturer's prior access to the criterion measures and the workbook, GCIT immediate scores of workbook subjects were significantly higher than such scores of lecture subjects. In practical terms the differences were slight, but statistically speaking the programmed condition was superior. That the difference resulted primarily from the consistent manner in which subjects learned with the workbook seems of particular interest. The

lecturer apparently improved in his teaching efficiency, as lecture subjects eventually performed as well on the GCIT as had workbook subjects throughout.

Two implications seem clear: (a) information felt important was presented in more consistent fashion through the medium of the programmed workbook; (b) either lecture or workbook approach seemed quite acceptable to students.

Treatment group differences in GCIT performance were no longer evident after approximately one month of fall quarter had passed. It would seem that either learnings acquired through the lecture, tended to be more stable or the common experience in the College setting equalized prior differences.

4. There was little doubt that the lecturer was more successful in preparing subjects for the registration process. That the programmed approach was not grossly incompetent was evidenced by the 64.1 per cent of workbook subjects rated "well prepared" for registration. However, 78.0 per cent of lecture subjects received an equivalent rating. The findings relate to mechanical aspects of registration (time conflicts, eligibility for courses, etc.), as no attempt was made to judge quality of tentative schedules.

The lecturer enjoyed the obvious advantage of being able to work with students on an individual basis. Such was his approach during the latter portion of the first and during parts of the second College Meeting. Much of his time during these periods was spent checking and discussing tentative course outlines with individual students. Subjects using the programmed manual, on the other hand, had much less opportunity for personal assistance from the College representative directing their meeting. Information important to the registration process was presented in the workbook, and students

were then expected to be responsible for making their own tentative plans. Under these circumstances to expect the workbook to prepare subjects for registration as adequately as the lecturer was perhaps unrealistic.

The registration section of the workbook could be revised and expanded but it seems questionable to the investigator whether such a reorganization would make an appreciable difference. Depending on the plans and registration problems of the individual student, the lecturer was free to make a wide variety of responses and interpretations. To attempt to program a comparable variety of contingencies would likely result in a workbook with unmanageable time limits and poor motivational qualities. The most promising compromise seems, to the writer, to be presentation of important registration information in a programmed workbook, followed by opportunity for interaction between student and College representative. Enrollees would thereby receive personal assistance with their individual registration ;lans and problems. This assumes a manageable ration between prospective students and staff.

5. It was also apparent that fewer lecture subjects became delinquent in completing the General College Comprehensive Examination on schedule. Proportions of subjects who became delinquent were small, ranging from 6.3 per cent in the C_1 group to 13.6 per cent in E_1.

The discrepancy between E_1 and E_2 workbook groups was greater (by one percentage point) than that between E_2 and C_1. This was puzzling until the investigator learned the College representative responsible for E_2 groups had, at the close of all second College Meetings, reminded students of the Comprehensive Examination requirement. Although this was an unwanted deviation from outlined

experimental procedures, it did point to the possible influence of verbal reinforcement on information presented in the workbook. Perhaps a generalization can be inferred: instructions felt to be of particular importance are more likely to be carried out if programmed presentation is followed by brief verbal reinforcement. At least such seemed to be the case for workbook subjects and subsequent delinquency on the examination.

An alternative approach would be to revise the workbook section in which information about the Comprehensive Examination is presented. Since relatively few items deal with the need for completing the examination as scheduled, this seems a realistic possibility. Workbook length would not be appreciably altered and efficiency would possibly be increased. Further experimentation would be needed to determine the effect of such a minor reorganization.

6. Although the tests of hypotheses were confined to comparisons between experimental groups (E_1, E_2, and C_1), consideration of the "orientation as usual" group gives rise to interesting speculations. The speculations are valid to the extent that two assumptions were met: (a) C_2 subjects were comparable to subjects in the experimental groups; (b) the orientation experience of C_2 subjects did in fact represent orientation as it typically occurred in the General College. The first assumption seems tenable; on such variables as scholastic aptitude, high school achievement, male-female ratio, and age, there was little differentiation. Evidence supporting the second was more difficult to obtain. Perhaps the notion that there is a typical orientation experience ("orientation as usual") is a fiction. Nonetheless, <u>all</u> individual groups

(representing three faculty lecturers) comprising the total C_2 sample could be distinguished from <u>all</u> E_1, E_2, and C_1 groups on two counts. First, mean GCIT immediate scores of C_2 groups still had significantly lower scores. In addition, ratings of registration preparation of C_2 subjects closely resembled ratings of workbook subjects, being clearly discrepant from more favorable C_1 ratings. The same seemed true of delinquency on the Comprehensive Examination, C_1 subjects having the lowest rate while C_2 rates were comparable with E_1 and E_2.

To the extent the necessary assumptions were met, at least four implications emerge: (a) the C_1 lecturer was indeed "superior" in his orientation presentations (in line with the predictions of college officials); (b) the importance of the lecturer variable in traditional approaches to orientation is emphasized; (c) consistency of performance is again highlighted as a major asset of the programmed workbook; (d) workbook groups fared considerably better on some criteria and at least as well on all others when compared with C_2.

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